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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/767,588	01/23/2001	Hiroshi Niwa	JP9-2000-0068US1 (8728-47)	2738

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EXAMINER

AKKAPEDDI, PRASAD R

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 12/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/767,588	Applicant(s) NIWA ET AL.	
	Examiner Prasad R Akkapeddi	Art Unit 2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 16-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 16-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input checked="" type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Drawings

2. The drawings filed on 09/22/2003 are acceptable subject to correction of the informalities indicated on the attached "Notice of Draftsperson's Patent Drawing Review," PTO-948. In order to avoid abandonment of this application, correction is required in reply to the Office action. The correction will not be held in abeyance.

3. The distance 'D' is not shown in the figures. The applicant's arguments state that the distance 'D' is shown in Fig. 2A. However, the Examiner is not able to find this

distance in Fig. 2A. It is respectfully requested that the applicant point out where in Fig. 2A this distance is shown.

4. The proposed correction to Fig. 3 is approved.

Claim Objections

5. Claim 16 is objected to because of the following informalities: "predetermined expansion distance of a pollutant" is not clear. The Examiner requests the applicant to explain what is meant by a 'predetermined expansion distance of a pollutant' or point out where it is defined in the specification. Appropriate correction is required.

6. Claim 18 is objected to because of the following informalities: The word 'supproessor' appears to be misspelled. Appropriate correction is required.

7. Objection to claim 2 in the Office Action dated 06/18/2003 is withdrawn due to the proposed amendment.

Specification

8. The proposed amendment to the abstract is approved.

Response to Arguments

9. Applicant's arguments with respect to claims 1-12 and 16-21 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 2871

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 1,6 ,9, 17-21(new) are rejected under 35 U.S.C. 102(e) as being anticipated by Saito et al. (Saito) (U.S.Patent No. 6,304,308).

As to claims 1, 6, 9: Saito discloses a liquid crystal display having a first substrate (DSUB) and a second substrate (USUB) which are disposed with a predetermined gap (Figs. 1-8), in which liquid crystal (LC) is sealed in the gap, comprising post structures (SPC-P) for controlling the gap between the first substrate and the second substrate; a sealing material (SL) provided outside a display area for sealing the liquid crystal in the gap, and forming an open injection hole (INJ) for injecting said liquid crystal; an end-sealing material (SL) for sealing the injection hole (INJ) after said liquid crystal is sealed in; and injection hole post structures (Fig. 8) and (col. 9, lines 2-4) provided in an area near the injection hole, for dividing the injection hole into a plurality of portions by using the same material as the post structures (col. 7, lines 49-52) and (col. 8, lines 45-48). Saito discloses a strip spacer and the pole spacers are made of a material such as negative resist BPR-113 (col. 7, lines 49-52) and the strip spacer (SPC-S) formed at the outer periphery of the display area for use as a liquid crystal injection port (col. 8, lines 45-48).

Saito discloses a penetration suppressor (sealant SL). Sealants are used for suppressing the penetration of a pollutant generated from the connection portion (INJ) into the display area, as recited in claim 6. Sato also discloses post members (SPC-P) having a pattern (Fig. 4) for controlling the gap, as recited in claim 9.

As to claims 18 and 20: Due to the arrangement of the shield film (SHF) and the protective film (PSV1) and the formation of the seal (SL) (penetration suppressor) and the injection hole post structures on top of the shield film and the protective film, it can clearly be seen from Fig. 1 that the penetration suppressor (SL) and the injection hole post structures (INJ) are formed with a height lower than a height of a gap formed between the pair of substrates (SUB1 and SUB2).

As to claims 17,19 and 21: Saito discloses that the first substrate (SUB2) is a color filter substrate and the second substrate (SUB1) is an active matrix substrate (col. 10, lines 42-43).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 3-5, 8,10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito.

a. As to claims 3-5, 8, 10-11: Saito discloses that the injection hole post structures are formed at a position where part of them are in contact with the end-sealing material (Fig. 4) and the height of these post structures is lower than the SPC-S height as can be seen in Fig. 8 and hence the post structure height is less than the gap between the substrates. The effect of liquid crystal deterioration, thus the charge retention capacity, is fully disclosed in (col. 7, lines 49-60). The penetration suppressor is a pair of post structures which is close to the projecting portion and extending from the vicinity of the substrate end in the injection hole to the display area (Fig. 4). The plurality of injection hole post structures forms plurality of rows toward the display area from a position close to the substrate end in the injection hole (Fig. 8). Since the injection hole is filled with end-sealing material and the injection hole post structures are inside the injection hole, they are in contact with the end-sealing material.

Saito does not explicitly state the deterioration of the charge retention of the liquid crystal from the material of the injection hole post structure.

However, Saito does disclose the material of the pole spacers dissolving into the liquid crystal material and will not exhibit imbibition and swelling. The sealing material which is deposited along the outer edges is disclosed in (col. 8, lines 21-22).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the configuration of the injection post structures to eliminate visualization irregularities during displaying of on-

screen images, including flutter, moiré, streaking and pixel jitter at certain intensities.

14. Claims 2, 12 and 16 (new) are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito in view of Ohashi et al. (Ohashi) (U.S. Patent No. 5,798,813).

Although Saito discloses injection port (INJ) may be replaced with an array of two or more liquid crystal injection ports (col. 9, lines 2-4), Saito does not disclose the width of these injection holes, nor does he disclose the separation distance of these holes from the display area.

Ohashi on the other hand, in disclosing a liquid crystal cell, discloses several dam seals (36a) in the injection port area (36) having a pitch of 1.5mm to 3mm, with a diameter of 0.25mm. The distance between these seals and the display area is shown as 'P' (Figs. 17 and 18) and disclosed in (col. 8, lines 48-50). From Figs 17 and 18 it can be seen that the space formed by the plurality of the injection hole post structures (dam seals) (0.3mm) is shorter than the double the distance (P). Since the seals have a pitch of 1.5mm to 3mm and the space formed by the injection post structures is 0.3mm, it is at least double the predetermined expansion distance of a pollutant. (Note: as pointed out in the claim objections above, the predetermined expansion distance is not defined and hence it could be taken as half of either the pitch distance or half of the space formed by the injection post structures).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the configuration of the injection

post structures minimize the turbulence in a flow of the liquid crystal and thus making the flow uniform and the liquid crystal is filled into the cell gap smoothly and uniformly (col. 8, lines 48-56). Ohashi discloses the hardening of the resin film by ultraviolet rays (col. 5, line 12).

15. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saito in view of Nakanowatari (U.S. Patent No. 4,820,025).

Saito does not disclose the bending of the seal material at an acute angle.

Nakanowatari in disclosing a liquid crystal cell, discloses that the corner portions of the substrates in which the injection hole is formed is cut away at an acute angle, thus the seal material that seals the injection port is also formed at an acute angle (Fig. 3).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the specific sealing configuration that is cut at an acute angle to enable the injection hole to come close to the bottom of the tank of the liquid crystal, thereby enabling effective use of an expensive liquid crystal (col. 2, lines 12-26).

Response to Arguments

16. Applicant's arguments filed 09/22/2003 have been fully considered but they are not persuasive.

Applicant's argument No. 1 (page 10, lines 2-5): Saito does not teach injection hole post structures or a penetration suppressor in the injection port.

Examiner's response to argument No. 1: Examiner respectfully disagrees with the applicant. Saito does teach the injection hole post structures (Fig. 8). Saito also discloses that the injection port (including the two or more injection ports) is sealed by a seal material (col. 8, lines 66-67) and (col. 9, lines 1-5). Hence the injection post structures are sealed thus preventing the liquid crystal material from leaking to the outside. The penetration suppresser's function is also to prevent such leakage. Hence, they are analogous.

Applicant's argument No. 2 (Page 11, lines 1-2): The post structures of Saito are formed in a display area and not in an area near the injection hole.

Examiner's response to argument No. 2: The applicant mistakenly identifies the post structures SPC-P as the injection hole post structures. The injection post structures are disclosed in Fig. 8 and described in (col. 9, lines 1-5) and from Fig. 8 it can clearly be seen the height of these structures is smaller than the height of SPC-S and hence from Fig. 1 it can be deduced that the height of the injection hole post structures is lower than the gap formed by the first and second substrate.

Applicant's argument No. 3 (Page 11, lines 13-17): 'a plurality of injection hole post structures provided in an area near the injection hole at a distance D from said display area and respectively disposed with a predetermined space therebetween, wherein said predetermined space formed by said plurality of injection hole post structures is shorter than double said distance D'.

Examiner's response to argument No. 3: Although the distance 'D' is not well defined, as pointed out earlier, assuming that the D is a distance is the distance

between the injection hole post structures and the display area, it can clearly be seen from Fig. 8 of Saito, that the injection hole post structures (INJ) are clearly far from the display area and hence will satisfy the recited limitation in claim 12. The injection ports as disclosed by Saito do contain post structures (as drawn in heavy lines in the injection port). Otherwise, the ports cannot be structurally stable. Though Ohashi was used to point out the distance between the inlet port and the effective display area (as pointed out by the applicant also), the combined teachings of Saito are quite appropriate.

Applicant's argument No. 4 (page 13, lines 1-2): Nakanowatari does not teach or disclose bending and sealing material at an acute angle.

Examiner's response to argument No. 4: Nakanowatari teaches that the corner positions of the substrate in which injection hole is formed are cut away at an obtuse angle. So, it is the substrates that have an obtuse angle and not the sealant. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made that the injection hole would have to be sealed with a sealant to prevent the liquid crystal from falling out. Hence, when a sealant is suppressed in the injection hole geometry as shown, the sealant would take the shape as that of the one shown by the applicant in Fig. 5, i.e., the sealant will have an acute angle. Hence, the teachings of Nakanowatari will apply to the recited limitation in the instant claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prasad R Akkapeddi whose telephone number is 703-305-4767. The examiner can normally be reached on 7:00AM to 5:30PM M-Th.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on 703-305-3492. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0530.

PRK

Prasad R Akkapeddi, Ph.D
Examiner
Art Unit 2871

T. Choudhury
Primary Examiner